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IN THE CLAIMS:

Please consider the claims as follows:

1. (canceled)

2. (canceled)

3. (canceled)

4. (currently amended) ~~The method of claim 1~~ A method of increasing the transmission efficiency of a PxQ arrayed waveguide grating (AWG) comprising: arranging the spacing and position of the P input ports and the Q output ports of said arrayed waveguide grating so as to increase a signal transmission coefficient from each of the P input ports to the Q output ports, wherein said arranging comprises:

initially positioning a first input port near the center of the AWG;

initially positioning the Q output ports at positions defined by images of wavelengths dispersed by the first input port;

initially positioning the remaining P-1 input ports of said AWG at positions defined by images of wavelengths dispersed by a substantially central output port of said AWG;

determining an angular spread, $\Delta\vartheta_q$, for each of the Q output ports, where $\Delta\vartheta_q$ is the angular spread of the images of wavelengths expected to converge on each of the output ports;

determining a final position for the P input ports by varying the initial position of the input ports until a value of $\Delta\vartheta_{MAX}$ is minimized, where $\Delta\vartheta_{MAX}$ is a maximum one of the determined angular spreads, $\Delta\vartheta_q$, for each of the output ports; and

repositioning the output ports of said AWG such that each output port is positioned in substantially the center of its respective final angular spread, $\Delta\vartheta_q$, wherein said respective final angular spreads are defined by the images of the wavelengths dispersed by the finally positioned input ports.

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5.   (original) The method of claim 4, wherein at least said initially positioned first input port comprises Q wavelengths that result in Q images for determining the initial positions of the Q output ports.

6.   (original) The method of claim 4, wherein said initially positioned substantially central output port comprises P wavelengths that result in P images for determining the initial positions of the remaining P-1 input ports.

7.   (original) An arrayed waveguide grating (AWG) comprising:

an input P x M star coupler;

an output M x Q star coupler; and

M waveguides of unequal length connecting said input and output star couplers;

wherein an initial position of a first input port is chosen to be near the center of the AWG and an initial position of the remaining P-1 input ports of said AWG is defined by images of wavelengths dispersed by a substantially central output port, and a final position of the input ports is defined by a subsequent variation of the defined initial position of the input ports, such that a value of $\Delta\vartheta_{MAX}$ is minimized, where $\Delta\vartheta_{MAX}$ is a maximum one of respective angular spreads, $\Delta\vartheta_q$, of the images of the wavelengths expected to converge for each of the output ports; and

wherein the position of the output ports of said AWG are positioned substantially in the center of respective final angular spreads, $\Delta\vartheta_q$, of images of wavelengths expected to converge for each of the output ports, wherein said respective final angular spreads are defined by the images of the wavelengths dispersed by the finally positioned input ports.

8.   (original) The AWG of claim 7, wherein the center axis of each output port is repositioned to maximize the weakest wavelength signal transmission coefficient for any wavelength dispersed from any of the P input ports.

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9. (original) The AWG of claim 7, wherein one or more wavelengths appearing at one or more of the Q output ports are of different diffraction orders.

10. (original) The AWG of claim 7, wherein the wavelengths appearing at the Q output ports are of the same diffraction order.

11. (original) The AWG of claim 7, wherein the spacing between adjacent output ports of said output coupler varies in an asymmetric and non-linear manner from a central output port.

12. (original) The AWG of claim 7, wherein said output star coupler comprises at least 2P −1 intermediate output ports.

13. (original) The AWG of claim 7, wherein said input star coupler comprises P equally spaced input ports, each of said input ports comprising Q equally spaced optical channels, and wherein the output ports of said output coupler are not uniformly spaced.

14. (original) The AWG of claim 13, wherein said Q equally spaced optical channels are equally spaced in wavelength.

15. (original) The AWG of claim 13, wherein said Q equally spaced optical channels are equally spaced in frequency.

16. (original) The AWG of claim 7, wherein the number of input ports is equal to the number of output ports, P = Q.

17. (original) The AWG of claim 7, wherein the spacing between adjacent output ports of said output coupler varies in an asymmetric and non-linear manner from a substantially central output port.

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18.   (new) A method of designing a PxQ arrayed waveguide grating (AWG) comprising:

   initially positioning a first input port near the center of the AWG;

   initially positioning the Q output ports at positions defined by images of wavelengths dispersed by the first input port;

   initially positioning the remaining P-1 input ports of said AWG at positions defined by images of wavelengths dispersed by a substantially central output port of said AWG;

   determining an angular spread, $\Delta\vartheta_q$, for each of the Q output ports, where $\Delta\vartheta_q$ is the angular spread of the images of wavelengths expected to converge on each of the output ports;

   determining a final position for the P input ports by varying the initial position of the input ports until a value of $\Delta\vartheta_{MAX}$ is minimized, where $\Delta\vartheta_{MAX}$ is a maximum one of the determined angular spreads, $\Delta\vartheta_q$, for each of the output ports; and

   repositioning the output ports of said AWG such that each output port is positioned in substantially the center of its respective final angular spread, $\Delta\vartheta_q$, wherein said respective final angular spreads are defined by the images of the wavelengths dispersed by the finally positioned input ports.

19.   (new) The method of claim 18, wherein at least said initially positioned first input port comprises Q wavelengths that result in Q images for determining the initial positions of the Q output ports.

20.   (new) The method of claim 18, wherein said initially positioned substantially central output port comprises P wavelengths that result in P images for determining the initial positions of the remaining P-1 input ports.